

### **REMARKS**

Claims 1-32 and 35-51 are currently pending in the subject application and are presently under consideration. Claims 1-3, 5, 7, 10, 11, 13, 18-19, 21, 23, 25-29, 31, 32, 37, 38, 40, and 44 have been amended as shown on pages 4-12 of the Reply. Claims 14 and 24 have been cancelled. In addition, the specification has been amended as indicated on pages 2-3.

Applicant's representative thanks Examiner Zahr for the courtesies extended during the telephonic interview conducted on November 19, 2008. The participants discussed the proposed claim amendments, focusing in particular on the feature of dynamically locating a notification herald with respect to a user's focus of attention based on an urgency of the notification. The Examiner indicated that this feature did not appear to be disclosed in the currently cited references, and that an additional search would be necessary given these amendments.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

#### **I. Rejection of Claims 1-4, 8-9, 13-14, 18-22, 30-42, and 48-50 Under 35 U.S.C. §103(a)**

Claims 1-4, 8-9, 13-14, 18-22, 30-42, and 48-50 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Flickner, *et al.* (US 6,577,329) in view of Horvitz, *et al.* (Attention Sensitive Alerting, July 1999, In Proceedings of UAI '99, Conference on Uncertainty and Artificial Intelligence, Morgan Kaufmann: San Francisco pp. 305-313). It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Flickner, *et al.* and Horvitz, *et al.*, individually or in combination, do not teach or suggest each and every feature of the subject claims.

A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *KSR v. Teleflex*, 550 U.S. \_\_\_, 127 S. Ct. 1727 (2007) citing *Graham v. John Deere Co. of Kansas City*, 383 U. S. 1, 36 (warning against a “temptation to read into the prior art the teachings of the invention in issue” and instructing courts to “guard against slipping into the use of hindsight” (*quoting Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))).

The subject claims relate to minimally intrusive message notification based on a user's present activities and an urgency associated with the message. A user's activities, cognitive load,

and focus of attention can be inferred by processing attentional inputs associated with the user. Incoming messages can be prioritized with an urgency value, and a notification herald can be displayed to alert the user of the message. This notification herald can be displayed at a level of intrusiveness appropriate to the urgency of the message and the user's current activities and cognitive load. Techniques for controlling the intrusiveness of a herald can include rendering the herald a selected distance from the user's current focus of attention, wherein the selected distance is a function of the urgency of the message set against the user's current activities. In this way, heralds having a lower urgency can be displayed at a default location at the periphery of the display area, and can move increasingly closer to the user's focus of attention as the urgency increases. In particular, amended independent claim 1 recites, *an information controller that receives attentional inputs associated with a user and determines the user's current activity and focus of attention, the information controller dynamically generates the information herald on one or more display screens, wherein **the information herald is dynamically located such that the distance of the herald's location from the user's focus of attention is a function of the urgency value and the user's determined activity.***

Flickner, *et al.* does not teach or suggest these aspects of the claims. Flickner, *et al.* relates to a system for viewing information on a ticker-style information display. When a user is focused on a particular item on the ticker as determined by an gaze tracking device, the system displays a pop-up text window containing additional information for the item. However, the cited reference does not disclose any techniques for controlling the location of this pop-up window on the user's display, much less controlling the display location based on an urgency of the information. Indeed, since the system of Flickner, *et al.* only provides a pop-up window when there is an assumption that the user wishes to read the information *at that moment* (given that the window associated with a item only appears when the user is focused on the item), there is no motivation in the cited reference to vary the level of intrusiveness of the window based on an urgency of the information.

Horvitz, *et al.* is also silent regarding this technique for controlling intrusiveness of a notification herald. Horvitz, *et al.* provides an introduction to the concept of attention-sensitive alerting, and discloses general techniques for weighing a criticality of a new message against a user's current attentional focus to determine an expected cost of alerting the user of the message. However, while Horvitz, *et al.* proposes controlling intrusiveness of an alert using techniques

such as deferred alerting and grouping multiple alerts into a single notification, the cited reference does not contemplate locating a notification herald on a display *at a distance from the user's current focus of attention that is based on the urgency of the message*.

Similarly, amended independent claim 21 recites, *means for determining a user's current focus of attention; [and] means for **dynamically locating the message in a user's workspace such that the distance between the message location and the user's focus of attention decreases with increasing message priority***. As discussed above, neither cited reference teaches or suggests locating a message on a display such that the distance between the user's focus of attention and the display location is a function of the urgency of the message. More specifically, the cited references specifically fail to disclose that this distance decreases as the message priority increases.

The subject claims also disclose that the priority of a message can be determined by considering a cost to the user of being interrupted by a particular notification given the user's current attentional state. This can be captured by an attention model that employs a utility function measuring these factors. The output of this model, representing a priority for the message, can then be used to determine an appropriate level of intrusiveness for notification of the message. To this end, amended independent claim 32 recites, *constructing an attention model to analyze the user's activities, **the attention model analyzes a utility,  $u(D_i, A_j)$ , capturing a cost of a user in an attentional state  $A_j$  being disrupted by a task or communication event  $D_i$ , and dynamically placing information alerts within a workspace at a selected distance from the user's current focus of attention, the selected distance based at least in part on the utility generated from the attention model***. As already discussed, neither Flickner, *et al.* nor Horvitz, *et al.* discloses dynamically locating an alert with respect to a user's focus of attention based on the priority of the message. The cited references therefore also fail to disclose controlling the location of an alert in this manner based on a priority that considers the user's current attentional state and a cost of interruption by a communication event given the attentional state.

With further regard to intelligent selection of a display location for a herald, the subject claims teach that user controls can be provided that allow a user to configure preferences regarding how a notification herald is presented. These controls can include settings that allow a user to specify a minimum priority level at which a herald will be moved toward the user's focus of attention. Incoming heralds having a priority level below this specified level can be

maintained at the periphery of the user's display to minimize interruption. In particular, amended independent claim 37 recites, *providing one or more user controls to guide a herald on a display, the user controls allowing a user to configure preferences regarding how the herald is displayed; determining a priority for a received herald; dynamically controlling the display location of the received herald, wherein **the distance of the display location from the user's determined focus of attention is based at least in part on the user's activities, the priority, and the preferences configured in the user controls, the preferences including at least a setting that allows a user to specify a herald priority level below which a herald will remain at a periphery of the display.*** The cited references do not teach or suggest controlling the distance between a herald and a user's focus of attention based on the user's monitored activities, as already discussed. Flickner, *et al.* and Horvitz, *et al.* also fail to disclose associated user controls that allow a user to specify a herald priority level below which an incoming herald will be maintained at the periphery of the display. With regard to user controls used to guide a herald, the Examiner indicates in particular the eye tracking feature described in Flickner, *et al.* However, this feature is described in the cited reference as only being used to select a ticker item and subsequently trigger the display of an associated text window. The indicated eye tracking technology cannot be used to accept *user preferences* regarding how a herald will be displayed, much less a particular user preference that sets a priority level below which a herald will be maintained at a display periphery.

The subject claims also disclose that a dwell time for an information herald can be adjusted based on such factors as the user's current workload (as determined by the user's inferred activities). This can cause the herald to remain visible for relatively longer dwell times if the user is determined to be engaged in another activity, providing the user with more time to review the message. The dwell time can also be a factor of the location of the herald with respect to the user's current focus of activity, such that heralds located further from the user's focus can have extended dwell times, affording the user more time to review the content of the herald. In particular, amended claim 18 recites, *the information controller employs a dwell time for display of the information herald **whose duration dynamically adjusts based on at least one of the distance of the herald's display location from the user's focus of attention or the user's workload.*** Flickner, *et al.* and Horvitz, *et al.* are silent regarding such a dynamically adjustable notification dwell time. Although the Examiner cites the use of a dwell time in Flickner, *et al.*, it

is noted that this indicated dwell time refers to the duration a user's gaze must be fixed on a ticker item in order to trigger an informational pop-up window associated with the item. The cited dwell time does not relate in any way to *how long a notification is displayed*.

Consequently, it cannot be said that Flickner, *et al.* teaches or suggests dynamically adjusting such a dwell time base on a user's workload or the distance of the notification from the user's focus of attention.

In view of at least the foregoing, it is respectfully submitted that Flickner, *et al.* and Horvitz, *et al.*, individually or in combination, do not teach or suggest all aspects of amended independent claims 1, 21, 32, and 37 (and all claims depending there from), and as such fail to make obvious the present invention. It is therefore requested that this rejection be withdrawn.

## **II. Rejection of Claims 5-7, 10-12, 23, and 27-28 Under 35 U.S.C. §103(a)**

Claims 5-7, 10-12, 23, and 27-28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Flickner, *et al.* (US 6,577,329) in view of Horvitz, *et al.* (Attention Sensitive Alerting, July 1999, In Proceedings of UAI '99, Conference on Uncertainty and Artificial Intelligence, Morgan Kaufmann: San Francisco pp. 305-313) in further view of Samar (US 5,563,514). However, it is respectfully submitted that Samar fails to remedy the deficiencies of Flickner, *et al.* and Horvitz, *et al.* with respect to the features of the subject claims.

Amended independent claim 23 recites, *automatically determining an output region for a message; automatically determining a priority for the message; automatically placing the message in the output region; automatically placing the output region in a default region of a workspace; and dynamically moving the output region increasingly closer to the user's focus of attention as the priority of the message increases*. As discussed *supra*, neither Flickner, *et al.* nor Horvitz, *et al.* disclose dynamically locating a message notification with respect to the user's focus of attention based on the priority of the message. Samar is also silent regarding these aspects. Samar relates to an information retrieval and display technique whereby hovering a cursor over a displayed item of interest causes additional information associated with the item to be retrieved and displayed to the user. However, Samar makes no mention of determining a priority for a message, and therefore does not teach or suggest moving an output message increasingly closer to a user's focus of attention as such a determined priority increases.

Moreover, claims 5-7 and 10-12 depend from amended independent claim 1, and as already noted, Samar fails to make up the shortcomings of Flickner, *et al.* and Horvitz, *et al.* with regard to dynamically locating a herald relative to a user's focus of attention based on the urgency of the herald, as disclosed in that independent claim.

In view of at least the forgoing, it is respectfully submitted that Flickner, *et al.*, Horvitz, *et al.*, and Samar do not teach or suggest all aspects of amended independent claims 1 and 23 (and all claims depending there from), and as such fail to make obvious the present invention. It is therefore requested that this rejection be withdrawn.

### **III. Rejection of Claims 16-17, 43, 45-47, and 51 Under 35 U.S.C. §103(a)**

Claims 16-17, 43, 45-47, and 51 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Flickner, *et al.* (US 6,577,329) in view of Horvitz, *et al.* (Attention Sensitive Alerting, July 1999, In Proceedings of UAI '99, Conference on Uncertainty and Artificial Intelligence, Morgan Kaufmann: San Francisco pp. 305-313) in further view of Monnes, *et al.* (US 6,459,440). However, claims 16-17 depend from amended independent claim 1, and claims 43, 45-47, and 51 depend from amended independent claim 37. As already discussed, Flickner, *et al.* and Horvitz, *et al.* do not teach or suggest dynamically locating an informational herald relative to a user's focus of attention based on an urgency of the information, as disclosed in those independent claims. Those cited references are also silent regarding user controls that allow a user to specify a priority level below which a herald will be maintained at the peripheral area of a display, as set forth in amended independent claim 37. Monnes, *et al.* fails to remedy these deficiencies. Monnes, *et al.* relates to a technique for managing pop-up windows associated with an application running on an electronic device, such that all or portions of the pop-up windows are deleted automatically when the associated application determines that the information contained therein is obsolete. However, Monnes, *et al.* does not contemplate methods to *control the location* of a message on a display *relative to a user's focus of attention*, and more specifically fails to disclose locating a message a selected distance from the user's focus of attention, *the distance being a function of the urgency of the message*.

In view of the above, it is respectfully submitted that Flickner, *et al.* and Horvitz, *et al.*, alone or in combination with Monnes, *et al.*, do not disclose all features of amended independent

claims 1 and 37 (and all claims depending there from), and as such fail to make obvious the present invention. It is therefore requested that this rejection be withdrawn.

**IV. Rejection of Claims 24-26 Under 35 U.S.C. §103(a)**

Claims 24-26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Flickner, *et al.* (US 6,577,329) in view of Horvitz, *et al.* (Attention Sensitive Alerting, July 1999, In Proceedings of UAI '99, Conference on Uncertainty and Artificial Intelligence, Morgan Kaufmann: San Francisco pp. 305-313) in further view of Samar (US 5,563,514) and in further view of Hirosawa, *et al.* (US 5,987,234). However, claims 24-26 depend from amended independent claim 23, and as discussed *supra*, neither Flickner, *et al.* nor Horvitz, *et al.* disclose moving a message closer to a user's focus of attention as the message's priority increases, as disclosed in that independent claim. Hirosawa, *et al.* is also silent regarding these features. Hirosawa, *et al.* relates to a console that manages a plurality of disparate processing systems, and that includes a display that allows status information for the disparate processing systems to be displayed in a managed window environment. However, like the references already discussed, Hirosawa, *et al.* does not teach or suggest decreasing the distance between a message herald and a user's focus of attention as a function of the urgency of the message.

In view of this, it is respectfully requested that this rejection be withdrawn with respect to claims 24-26, which depend from amended independent claim 23.

**V. Rejection of Claim 29 Under 35 U.S.C. §103(a)**

Claim 29 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Flickner, *et al.* (US 6,577,329) in view of Horvitz, *et al.* (Attention Sensitive Alerting, July 1999, In Proceedings of UAI '99, Conference on Uncertainty and Artificial Intelligence, Morgan Kaufmann: San Francisco pp. 305-313) in further view of Samar (US 5,563,514) and in further view of Monnes, *et al.* (US 6,459,440). However, as discussed *supra*, none of the cited references disclose moving a message increasingly closer to a user's focus of attention as the priority of the message increases, as disclosed in amended independent claim 23. It is therefore respectfully requested that this rejection be withdrawn with respect to amended claim 29, which depends from that independent claim.

**VI. Rejection of Claims 15 and 44 Under 35 U.S.C. §103(a)**

Claims 15 and 44 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Flickner, *et al.* (US 6,577,329) in view of Horvitz, *et al.* (Attention Sensitive Alerting, July 1999, In Proceedings of UAI '99, Conference on Uncertainty and Artificial Intelligence, Morgan Kaufmann: San Francisco pp. 305-313) in further view of Hirosawa, *et al.* (US 5,987,234). However, claims 15 and 44 depend from amended independent claim 1 and 37, respectively, and as already noted with respect to those independent claims, none of Flickner, *et al.*, Horvitz, *et al.*, or Hirosawa, *et al.* teach or suggest locating a message a selected distance from the user's focus of attention, such that the distance is a function of the urgency of the message. Therefore, it is respectfully submitted that this rejection should be withdrawn with respect to claims 15 and 44.



**CONCLUSION**

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP474US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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